

Amendment and Response

Applicant: Jerome D. Brown et al.
Serial No.: 10/681,851
Filed: October 8, 2003
Docket No.: 10386US01
Title: TAPE REEL ASSEMBLY WITH STIFF WINDING SURFACE FOR A TAPE DRIVE SYSTEM

IN THE CLAIMS

Please cancel claim 9.

Please amend claims 1, 10-11, 35, 37, and 41 as follows:

1. (Currently Amended) A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:
a hub including a solid-core and defining an inner surface and opposite a tape winding surface, at least a portion of the hub being made of plastic;
wherein the hub includes a metal insert that forms at least a portion of the inner
~~surface~~the tape winding surface has an effective radial modulus of greater than
~~0.3 million pounds per square inch, the effective radial modulus defined as a ratio~~
~~of radial stress applied to the tape winding surface divided by a resulting radial~~
~~deformation at the tape winding surface due to the applied radial stress.~~
2. (Withdrawn) The tape reel assembly of claim 1, wherein the hub includes a metal insert that forms at least a portion of the tape winding surface.
3. (Withdrawn) The tape reel assembly of claim 2, wherein the metal insert is an annular ring of aluminum.
4. (Withdrawn) The tape reel assembly of claim 3, wherein the annular ring has a thickness in a range of approximately 0.005 inch to approximately 0.250 inch.
5. (Withdrawn) The tape reel assembly of claim 3, wherein the annular ring has a thickness of approximately 0.050 inch.
6. (Withdrawn) The tape reel assembly of claim 1, wherein the hub is a glass-filled polymer.

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7. (Withdrawn) The tape reel assembly of claim 6, wherein the hub is 30% glass-filled styrene acrylonitrile.

8. (Withdrawn) The tape reel assembly of claim 7, wherein the tape reel assembly further includes:

a first reel section defining a first core portion and an upper flange; and
a second reel section defining a second core portion and a lower flange;
wherein upon final assembly, the first core portion and the second core portion combine
to define the hub.

9. (Cancelled)

10. (Currently Amended) The tape reel assembly of claim 91, wherein the metal insert includes an annular ring of steel.

11. (Currently Amended) The tape reel assembly of claim 91, wherein the metal insert is a cup shaped annulus that defines a drive washer and a drive bore.

12. (Withdrawn) The tape reel assembly of claim 1, wherein the hub includes:
a core of plastic between the inner surface and the tape winding surface; and
a metal insert disposed within the core.

13. (Withdrawn) The tape reel assembly of claim 12, wherein the metal insert is an annular ring of metal.

14. (Original) The tape reel assembly of claim 1, wherein the tape reel assembly further includes:

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an upper flange and a lower flange, the upper and lower flanges extending in a radial fashion from opposing sides of the hub, respectively.

15-25. (Canceled)

26. (Previously presented) A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:

a hub including a core and a backbone that combine to define an inner surface opposite a tape winding surface, at least a portion of the hub being made of plastic; wherein at least a portion of the inner surface is metal.

27. (Original) The tape reel assembly of claim 26, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.

28. (Original) The tape reel assembly of claim 26, wherein the tape winding surface has an effective radial modulus of approximately 1.0 million pounds-per-square-inch.

29. (Original) The tape reel assembly of claim 26, wherein the backbone defines a drive bore separated from the inner surface by a distance of approximately 0.5 inch.

30. (Original) The tape reel assembly of claim 26, wherein the backbone is a cup shaped annulus comprised of steel.

31. (Original) The tape reel assembly of claim 26, wherein the tape reel assembly further includes:

an upper flange and a lower flange, the upper and lower flanges extending in a radial fashion from opposing sides of the hub, respectively.

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32. (Withdrawn) A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:

a hub defining an inner surface and a tape winding surface, the hub including:
a plastic core disposed between the inner surface and the tape winding surface; and
a metal annulus disposed within the core.

33. (Withdrawn) The tape reel assembly of claim 32, wherein the tape winding surface has an effective radial modulus of greater than 0.3 million pounds-per-square-inch.

34. (Withdrawn) The tape reel assembly of claim 32, wherein the tape winding surface has an effective radial modulus of approximately 0.9 million pounds-per-square-inch.

35. (Currently Amended) A tape reel assembly for use in a tape drive system for winding and unwinding storage tape, the tape reel assembly comprising:

a hub including a solid-core and defining an inner surface and a tape winding surface, the core continuously solid between the inner surface and the tape winding surface
and at least a portion of the hub being made of plastic; and
means for configuring the tape winding surface to have an effective radial modulus of greater than 0.3 million pounds-per-square-inch; and
wherein the effective radial modulus is defined as a ratio of radial stress applied to the tape winding surface by wound storage tape divided by a resulting radial deformation at the tape winding surface due to the applied radial stress.

36. (Withdrawn) A data storage tape cartridge comprising:

a housing defining an enclosed region;
at least one tape reel assembly rotatably disposed within the enclosed region and including:
a hub defining an inner surface and a tape winding surface; and
a storage tape wound about the tape winding surface of the hub;

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wherein winding of the storage tape onto the hub applies a stress that deflects the tape winding surface, and further wherein the deflection of the tape winding surface resulting from the applied stress corresponds to an effective radial modulus of the tape winding surface of greater than 0.3 million pounds-per-square-inch.

37. (Currently Amended) A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:

a hub defining an inner surface ~~and opposite~~ a tape winding surface, the inner surface comprising a metal backbone, and at least a portion of the hub being made of plastic;

wherein the metal backbone configures the tape winding surface has to have an effective radial modulus of greater than 0.3 million pounds-per-square-inch, the effective radial modulus defined as a ratio of radial stress applied to the tape winding surface by wound storage tape divided by a resulting radial deformation at the tape winding surface due to the applied radial stress.

38. (Previously presented) The tape reel assembly of claim 37, wherein the metal backbone defines a drive washer and a drive bore.

39. (Previously presented) The tape reel assembly of claim 37, wherein the hub includes a plastic core defining the tape winding surface.

40. (Previously presented) The tape reel assembly of claim 37, wherein the backbone defines a cup shaped annular insert including an annular wall substantially parallel to the tape winding surface.

41. (Currently Amended) A tape reel assembly for use in a tape drive system for winding and unwinding a storage tape, the tape reel assembly comprising:

a hub including:

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a metal backbone defining an inner surface; and
a plastic core coupled to the backbone and defining a tape winding surface;
wherein the tape winding surface is disposed opposite of the inner surface.

42. (Previously presented) The tape reel assembly of claim 41, wherein the metal backbone is a metal cup shaped annular backbone defining a drive washer and a drive bore.

43. (Previously presented) The tape reel assembly of claim 42, wherein the drive washer and the drive bore are located in a plane exterior to the plastic core.

44. (Previously presented) The tape reel assembly of claim 41, wherein the metal backbone is an insert integrally formed with the plastic core.